Memorandum

To: Toni Schoen, Key Engineering **Date:** February 22, 2017

From: Teresa Bowers and Rosemary Mattuck

Subject: Initial Sampling Recommendations for COPC List Development for the Barclay Street Property

The property at 300 Barclay Street, Milwaukee, Wisconsin consists of several buildings that formerly housed industrial operations including a pigment plant and a lacquer and varnish plant. Three of the buildings on the property (buildings 11, 33, and 34) are now slated for redevelopment for residential use. This memo describes the sampling requested by Gradient, which will be conducted in order to determine the list of compounds of potential concern (COPCs) for which interior dust clearance standards should be developed.

This memo provides general guidelines for the collection of bulk samples for the identification of the COPC list. We understand that different operations may have occurred on each floor of each building, and thus the types of contamination may differ from floor to floor and building to building. We are interested in understanding what compounds may be present in building materials on or beneath the material surface. For example, although a surface may be cleaned, it is possible that compounds remaining within the material matrix may migrate to the surface over time. Therefore, the data quality objectives of this program can be achieved with a bulk sample of the building materials that will be retained during the renovation, collected from the surface inward. Gradient has not made a site visit to the buildings, and thus can give only general guidance based on photographs, and our understanding of the layout of the buildings and the materials that will be retained post-renovation, based on our discussions with Key Engineering. Gradient recommends that samples be collected as bulk dust samples. Samples should be collected as a 1 cm core from the surface of the materials being tested. The samples should be collected from the following types of surfaces: floors, ceilings, walls, columns. Materials sampled should include wood ceilings; tile ceilings; concrete floors, walls, and columns; and brick walls.

Preference should be given to sampling surfaces that will be retained, or that may be accessible to individuals in the final renovated space. However, the presence of VOCs and SVOCs should be investigated on porous surfaces such as brick and concrete, even if these materials may end up being behind dry wall in the renovated space. The concern is that porous materials could represent a threat of off-gassing of volatile chemicals over time into interior spaces, particularly once the building is insulated and heated.

We recommend that at least one concrete and one brick sample be collected from each building/floor that was known to have housed different types of operations, assuming that both concrete and brick in the location will be retained post-renovation. That is, if the same operations occurred on two floors of a building, then these floors can be combined for sampling purposes. Other types of materials should be

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sampled separately, *e.g.* the wood ceiling noted above. Based on the photographs, we recommend sampling the materials listed in Table 1. When selecting locations, we recommend sampling areas of discoloration or pigment. For example, Photo 15 has a discolored area on the floor directly under the pipe run; it is not possible to tell if that is just moisture or represents staining of some sort.

Gradient reviewed the available site investigation reports and hazardous waste files in order to determine analytes for the testing of the bulk dust samples. All samples should be tested for VOCs, SVOCs, PCBs, metals, and cyanide. The metals analysis should also include strontium, molybdenum, tin, and titanium, as the site records indicate that these metals either were or may have been used in pigment manufacturing operations. The VOCs should also include 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene, as they were detected in soil above the Wisconsin RCLs. The recommended analyte list is provided in Attachment 1.

Table 1. Suggested Sampling Locations Based on Photograph, and Post-Development Exposed Features

Building	Floor	Location	Samples
Bldg 11	B	concrete column	1
	1	concrete column, brick wall	2
	2	concrete floor, concrete column	2
	3	concrete floor, brick wall, concrete wall	3
	4	concrete floor, concrete column	2
	5	concrete column	1
	Penthouse	concrete floor	1
Bldg 33	1	brick wall, wood ceiling	2
	2	brick wall, wood ceiling	2
	3	concrete floor, tile ceiling	2
Bldg 34	1	concrete wall, concrete column	2
	2	concrete floor, brick wall, concrete column	3
	3	concrete floor, tile ceiling	2

Note: Number of samples assumes one sample per location.

Attachment 1

Recommended Analyte List

Group	Analyte
METALS	Aluminum
METALS	Antimony
METALS	Arsenic
METALS	Barium
METALS	Beryllium
METALS	Cadmium
METALS	Chromium, Hexavalent
METALS	Chromium, Total
METALS	Chromium, Trivalent
METALS	Cobalt
METALS	Copper
METALS	Cyanide
METALS	Iron
METALS	Lead
METALS	Magnesium
METALS	Manganese
METALS	Mercury
METALS	Molybdenum
METALS	Nickel
METALS	Potassium
METALS	Selenium
METALS	Silver
METALS	Sodium
METALS	Strontium
METALS	Thallium
METALS	Tin
METALS	Titanium
METALS	Vanadium
METALS	Zinc
PCB	AROCLOR-1016
PCB	AROCLOR-1221
PCB	AROCLOR-1232
PCB	AROCLOR-1242
PCB	AROCLOR-1248
PCB	AROCLOR-1254
PCB	AROCLOR-1260
PCB	AROCLOR-1262
PCB	AROCLOR-1268
SVOC	1,1'-BIPHENYL
SVOC	1,2,4,5-TETRACHLOROBENZENE
SVOC	1,2,4-TRICHLOROBENZENE
SVOC	1,2-DICHLOROBENZENE
SVOC	1,3-DICHLOROBENZENE
SVOC	1,4-DICHLOROBENZENE
SVOC	2,2'-OXYBIS(1-CHLOROPROPANE)
SVOC	2,3,4,6-TETRACHLOROPHENOL
SVOC	2,4,5-TRICHLOROPHENOL
SVOC	2,4,6-TRICHLOROPHENOL
SVOC	2,4-DICHLOROPHENOL
SVOC	2,4-DIMETHYLPHENOL
SVOC	2,4-DINITROPHENOL
SVOC	2,4-DINITROTOLUENE

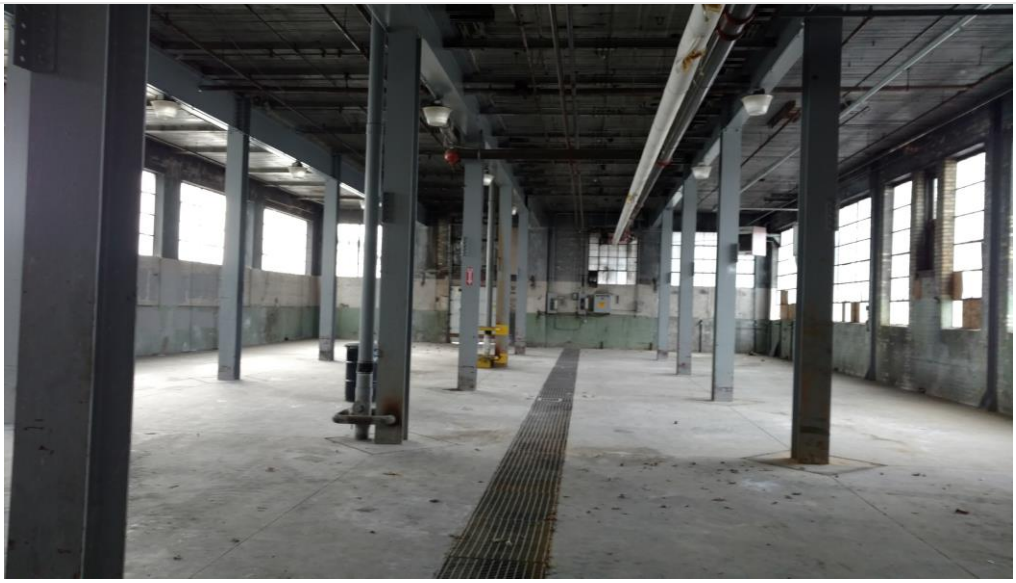
Group	Analyte
SVOC	2,6-DINITROTOLUENE
SVOC	2-CHLORONAPHTHALENE
SVOC	2-CHLOROPHENOL
SVOC	2-METHYLNAPHTHALENE
SVOC	2-METHYLPHENOL
SVOC	2-NITROANILINE
SVOC	2-NITROPHENOL
SVOC	3,3'-DICHLOROBENZIDINE
SVOC	3-NITROANILINE
SVOC	4,6-DINITRO-2-METHYLPHENOL
SVOC	4-BROMOPHENYL PHENYL ETHER
SVOC	4-CHLORO-3-METHYLPHENOL
SVOC	4-CHLOROANILINE
SVOC	4-CHLOROPHENYL-PHENYL ETHER
SVOC	4-METHYLPHENOL
SVOC	4-NITROANILINE
SVOC	4-NITROPHENOL
SVOC	ACENAPHTHENE
SVOC	ACENAPHTHYLENE
SVOC	ACETOPHENONE
SVOC	ANTHRACENE
SVOC	ATRAZINE
SVOC	BENZALDEHYDE
SVOC	BENZO(A)ANTHRACENE
SVOC	BENZO(A)PYRENE
SVOC	BENZO(B)FLUORANTHENE
SVOC	BENZO(G,H,I)PERYLENE
SVOC	BENZO(K)FLUORANTHENE
SVOC	BENZOIC ACID
SVOC	BENZYL ALCOHOL
SVOC	BENZYL BUTYL PHTHALATE
SVOC	BIS(2-CHLOROETHOXY) METHANE
SVOC	BIS(2-CHLOROETHYL)ETHER
SVOC	BIS(2-ETHYLHEXYL) PHTHALATE
SVOC	CAPROLACTAM
SVOC	CARBAZOLE
SVOC	CHRYSENE
SVOC	DIBENZO(A,H)ANTHRACENE
SVOC	DIBENZOFURAN
SVOC	DIETHYLPHTHALATE
SVOC	DIMETHYLPHTHALATE
SVOC	DI-N-BUTYLPHTHALATE
SVOC	DI-N-OCTYLPHTHALATE
SVOC	FLUORANTHENE
SVOC	FLUORENE
SVOC	HEXACHLOROBENZENE
SVOC	HEXACHLOROBUTADIENE
SVOC	HEXACHLOROCYCLOPENTADIENE
SVOC	HEXACHLOROETHANE
SVOC	INDENO(1,2,3-CD)PYRENE
SVOC	ISOPHORONE
SVOC	NAPHTHALENE
SVOC	NITROBENZENE
SVOC	N-NITROSODI-N-PROPYLAMINE

Group	Analyte
SVOC	N-NITROSODIPHENYLAMINE
SVOC	PENTACHLOROPHENOL
SVOC	PHENANTHRENE
SVOC	PHENOL
SVOC	PYRENE
VOC	1,1,1-TRICHLOROETHANE
VOC	1,1,2,2-TETRACHLOROETHANE
VOC	1,1,2-TRICHLOROETHANE
VOC	1,1,2-TRICHLOROTRIFLUOROETHANE
VOC	1,1-DICHLOROETHANE
VOC	1,1-DICHLOROETHENE
VOC	1,2,3-TRICHLOROBENZENE
VOC	1,2,4-TRICHLOROBENZENE
VOC	1,2-DIBROMO-3-CHLOROPROPANE
VOC	1,2-DIBROMOETHANE
VOC	1,2-DICHLOROBENZENE
VOC	1,2-DICHLOROETHANE
VOC	1,2-DICHLOROPROPANE
VOC	1,3-DICHLOROBENZENE
VOC	1,4-DICHLOROBENZENE
VOC	1,4-DIOXANE (P-DIOXANE)
VOC	2-HEXANONE
VOC	4-METHYL-2-PENTANONE
VOC	ACETONE
VOC	BENZENE
VOC	BROMOCHLOROMETHANE
VOC	BROMODICHLOROMETHANE
VOC	BROMOFORM
VOC	BROMOMETHANE
VOC	CARBON DISULFIDE
VOC	CARBON TETRACHLORIDE
VOC	CHLOROBENZENE
VOC	CHLOROETHANE
VOC	CHLOROFORM
VOC	CHLOROMETHANE
VOC	CIS-1,2-DICHLOROETHENE
VOC	CIS-1,3-DICHLOROPROPENE
VOC	CYCLOHEXANE
VOC	DIBROMOCHLOROMETHANE
VOC	DICHLORODIFLUOROMETHANE
VOC	DICHLOROMETHANE
VOC	ETHYLBENZENE
VOC	ISOPROPYLBENZENE
VOC	METHYL ACETATE
VOC	METHYL ETHYL KETONE
VOC	METHYLCYCLOHEXANE
VOC	METHYL-TERT-BUTYL-ETHER (MTBE)
VOC	NAPHTHALENE
VOC	STYRENE
VOC	TETRACHLOROETHENE
VOC	TOLUENE
VOC	TOTAL-1,2-DICHLOROETHENE
VOC	TRANS-1,2-DICHLOROETHENE
VOC	TRANS-1,3-DICHLOROPROPENE

Group	Analyte
VOC	TRICHLOROETHYLENE (TCE)
VOC	TRICHLOROFLUOROMETHANE
VOC	VINYL ACETATE
VOC	VINYL CHLORIDE
VOC	XYLENE, O-
VOC	XYLENES (TOTAL)
VOC	XYLENES, M & P
VOC	1,2,4-Trimethylbenzene
VOC	1,3,5-Trimethylbenzene

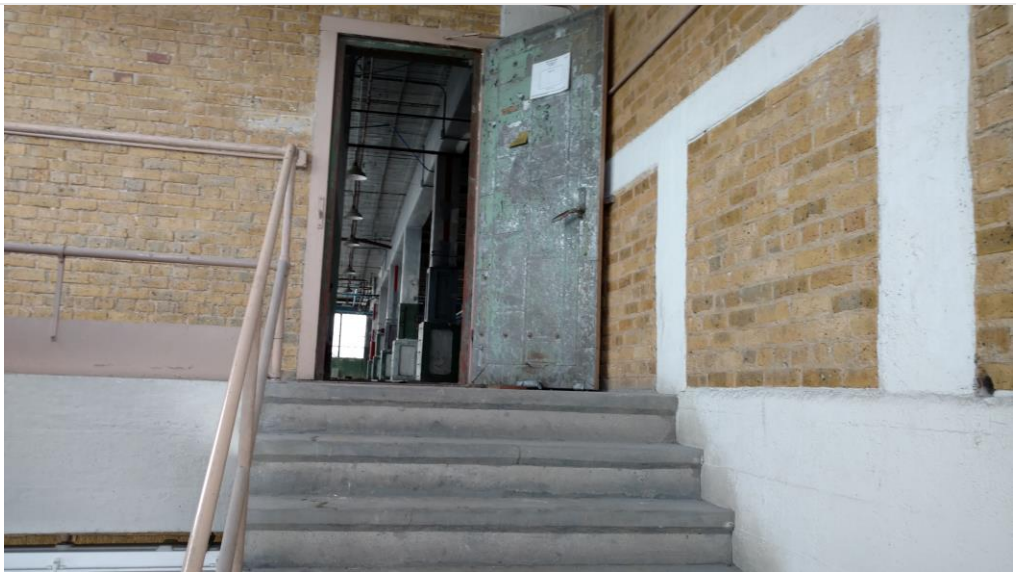
The Barclay, 300 South Barclay Street, 189 East Oregon Street, Milwaukee, Wisconsin

Building	Floor	Post Development Exposed Features	Material
11	Basement	walls	cement block
	Basement	ceiling	concrete
	Basement	columns	concrete
	1	walls	brick, concrete
	1	ceiling	concrete, steel
	1	columns	concrete, steel
	2	floor	concrete
	2	walls	brick, concrete
	2	ceiling	concrete
	2	columns	concrete
	3	floor	concrete
	3	walls	brick, concrete
	3	ceiling	concrete
	4	floor	concrete
	4	walls	concrete
	4	ceiling	concrete
	4	columns	concrete, steel
	5	walls	brick, cement block
	5	ceiling	concrete, steel
	5	columns	concrete, steel
	Stairwells	walls, stairs, floors	concrete, steel railings
33	1	walls	brick
	1	ceiling	wood, steel
	1	columns	steel
	2	walls	brick
	2	ceiling	wood, steel
	2	columns	steel
	3	floor	concrete
	3	walls	brick
	3	ceiling	terracotta tile, concrete
	3	columns	steel
	Stairwells	walls, stairs, floors	concrete, brick, steel railings
	Bridges Between Bldg 33 & 34	floor, wall	concrete, steel
	Exterior	stairs	steel
34	1	walls	brick, concrete
	1	ceiling	concrete
	1	columns	concrete
	2	floor	concrete
	2	walls	brick, concrete
	2	ceiling	concrete
	2	columns	concrete
	3	floor	concrete
	3	walls	brick, concrete
	3	ceiling	terracotta tile
	Exterior	stairs	steel



PHOTOGRAPH 1:

Building 33, First Floor
Concrete floors
Steel beams
Brick and window walls
Wood ceiling



PHOTOGRAPH 2:

Building 33, Stairwell From First to Second Floor
Concrete stairs
Steel hand railings
Brick, concrete, and window walls
Concrete ceiling

PHOTOGRAPH 3:

Building 33, Second Floor
Wood floors
Brick and window walls
Concrete columns
Wood ceiling

PHOTOGRAPH 4:

Building 33, Stairwell From Second to Third Floor
Concrete stairs
Steel hand railings
Brick, concrete, and window walls
Concrete ceiling

PHOTOGRAPH 5:

Building 33, Third Floor
Tile floors
Brick and window walls
Steel beams
Ceramic tile ceiling

PHOTOGRAPH 6:

Building 33, Third Floor
Tiled floors
Brick and window walls
Drywall interior walls
Ceramic tile ceiling

PHOTOGRAPH 7:

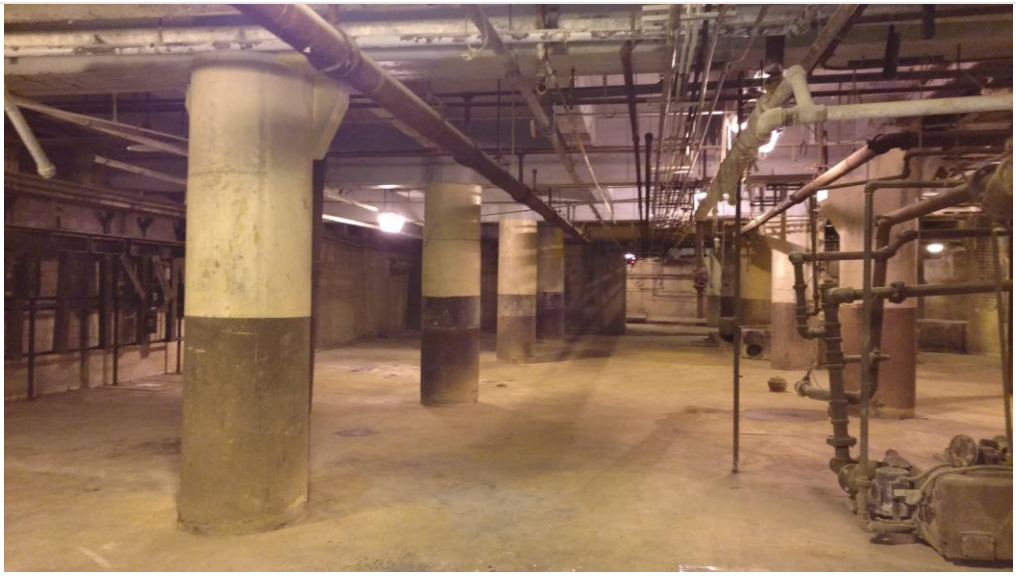
Building 34, First Floor
Concrete floors
Brick and window walls
Concrete columns
Concrete ceiling

PHOTOGRAPH 8:

Building 34, Second Floor
Concrete floors
Brick and window walls
Concrete columns
Concrete ceilings

PHOTOGRAPH 9:

Building 34, Third Floor
Concrete floors
Brick and window walls
Concrete columns
Ceramic tile ceiling



PHOTOGRAPH 10:

Building 11, Basement
Concrete floor
Cement block and glass tile window
Concrete columns
Concrete ceilings

PHOTOGRAPH 11:

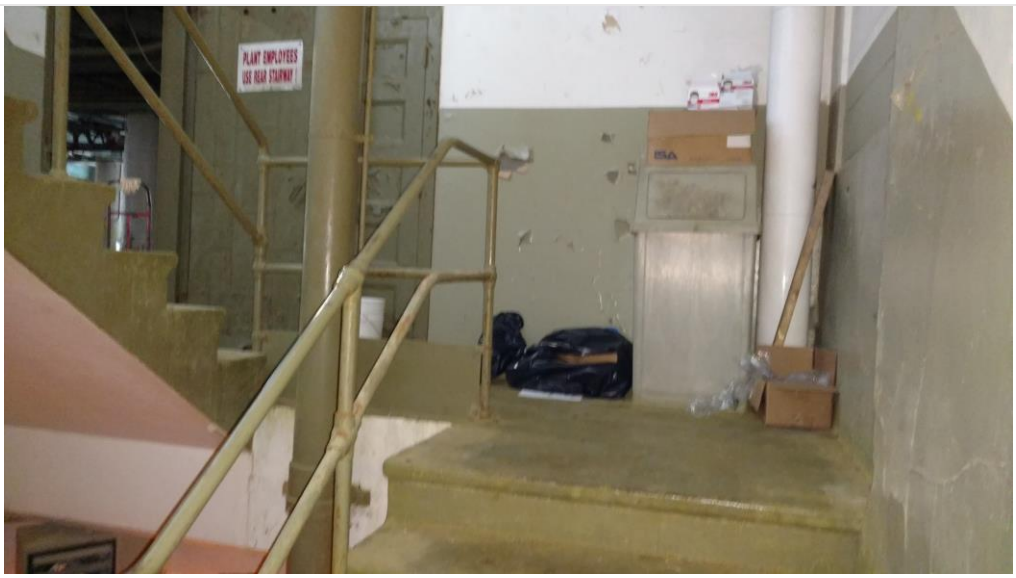
Building 11, Basement
Concrete floor
Cement block and glass tile window
Concrete columns
Concrete ceilings

PHOTOGRAPH 12:

Building 11, Basement
Concrete Weir in Settling Basin

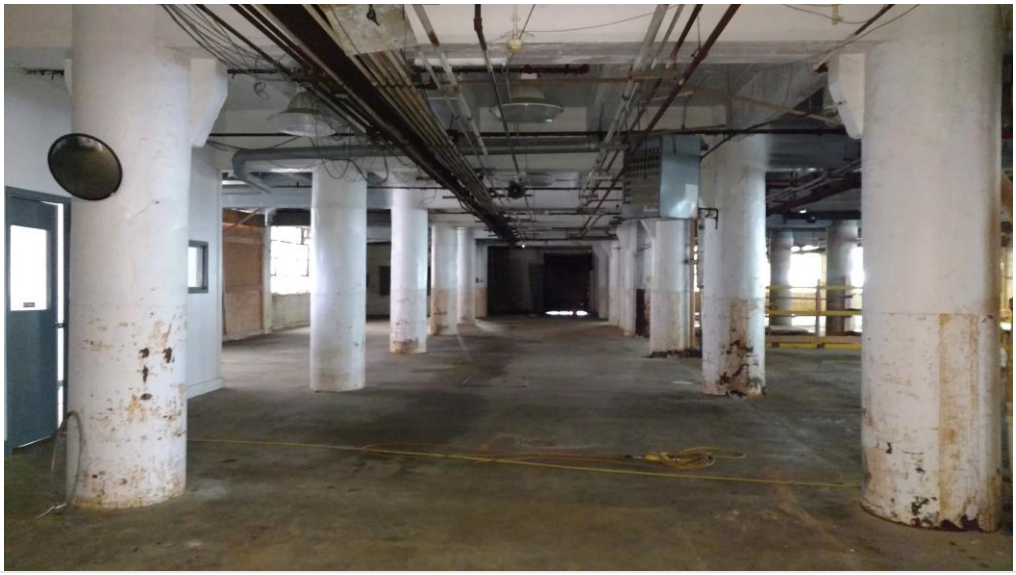
PHOTOGRAPH 13:

Building 11, Basement Door Leading to Northeast Tunnel



PHOTOGRAPH 14:

Building 11, Stairwell From First to Second Floor
Concrete stairs
Steel hand railings
Concrete walls
Concrete ceiling



PHOTOGRAPH 15:

Building 11, First Floor
Concrete floor
Brick and window walls
Concrete and steel columns
Concrete ceiling

PHOTOGRAPH 16:

Building 11, Stairwell From Second to Second Floor
Concrete stairs
Steel hand railings
Concrete walls
Concrete ceiling

PHOTOGRAPH 17:

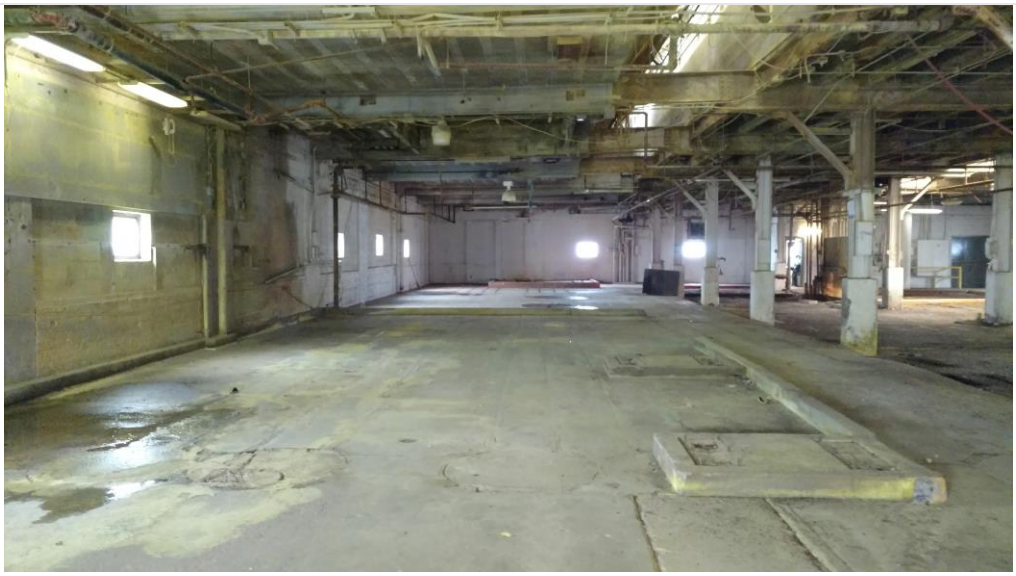
Building 11, Second Floor
Concrete floor
Brick and window walls
Concrete columns
Concrete ceiling

PHOTOGRAPH 18:

Building 11, Third Floor
Tile floor
Concrete and window walls
Concrete ceiling

PHOTOGRAPH 19:

Building 11, Fourth Floor
Concrete floor
Concrete and window walls
Concrete and steel columns
Concrete ceiling



PHOTOGRAPH 20:

Building 11, Fifth Floor
Concrete floor
Brick, cement block, and window walls
Concrete and steel clolumns/beams
Concrete and steel beam ceiling

PHOTOGRAPH 21:

Building 11, Penthouse
Concrete floor
Brick, and window walls
Steel beams and railings
Concrete ceiling